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A.D. 1869, 10th APRIL. N<sup>o</sup> 1104.

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S P E C I F I C A T I O N

OF

JOSEPH HAWORTH, HENRY HAUGHTON,  
AND ROBERT GIBBONS.

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FOR PREVENTING THE WASTING OF  
CONSUMING SMOKE IN BOILER FURNACES.

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LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY:

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.

1869.





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A.D. 1869, 10th APRIL. N° 1104.

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**Consuming Smoke in Boiler Furnaces.**

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*(This Invention received Provisional Protection only.)*

PROVISIONAL SPECIFICATION left by Giles Haworth, Henry Haughton, and Robert Gibbons at the Office of the Commissioners of Patents, with their Petition, on the 10th April 1869.

We, GILES HAWORTH, Engine Driver, HENRY HAUGHTON, Engine Driver, and ROBERT GIBBONS, Warper, all of Blackburn, in the County of Lancaster, do hereby declare the nature of the said Invention for  
5 “IMPROVED APPARATUS FOR FACILITATING THE CONSUMPTION OF SMOKE,” to be as follows:—

The object of this Invention is to facilitate the consumption of smoke  
10 by the use of apparatus constructed and arranged in connection with the furnaces of steam boilers of the class known as “hand fired,” so that when the door or doors are open during the act of firing a course for the passage of and directing the cold air to the flues is provided, whereby a large proportion of the air passes under the fire-  
15 bars and is diverted to the crown of the flue or flues at a point near the bridge, so as to intercept or mingle with the flame and heated gases passing over said bridge instead of entering the furnace and passing over the fire, the latter being one of the principal causes of the generation of smoke.



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*Haworth, Haughton, & Gibbons' Improvements in Consuming Smoke.*

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We construct the “bridge” with an elongated opening therein; this opening is covered by a damper plate to which is attached a rod supported by a cross bar at each end thereof; the said rod extends from the damper plate to near the front of the flue. To the front end of the rod is attached an arm so constructed that on the furnace door being 5 opened the damper plate is drawn from the opening in the bridge and admits the cold air to the flue by way of such opening instead of direct to the fire during the operation of firing, the air on passing through the opening in the bridge is directed to the crown of the flue by a curved plate placed at the back of the bridge, so that the air, flame, and 10 heated gases passing over the bridge mingle, and the formation of smoke is prevented. When the furnace door is closed the damper plate is also closed partially on the opening in the bridge, but yet admitting the passage of the desired quantity of air to ensure consumption of smoke.

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